

What is claimed is:

1. An image distortion correcting apparatus, comprising:

a reference image generating means for generating a reference image

5 and setting a coordinate of the reference image;

a displacement measuring means for displaying the reference image on a screen and measuring a coordinate of the displayed image;

a distortion information extracting means for extracting distortion information on the basis of a coordinate value of the set reference image and a  
10 coordinate value of the measured image and generating inverse-distortion information; and

a distortion correcting means for generating an inverse-distorted image of the reference image on the basis of the generated inverse-distortion information.

15 2. The apparatus of claim 1, further comprising:

a memory means for updating the generated inverse-distortion information and storing it.

3. The apparatus of claim 2, wherein the memory means uses a  
20 SRAM (static random access memory) so as to be performable high speed storing and access of the inverse-distortion information.

4. The apparatus of claim 1, wherein the distortion information extracting means includes an image interpolating means in order to perform pixel  
25 unit interpolation of the reference image.

5. The apparatus of claim 4, wherein the image interpolating means uses one of a one-dimensional interpolation, a two-dimensional interpolation, a linear interpolation, a nearest interpolation and a three-dimensional interpolation.

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6. The apparatus of claim 1, wherein the distortion information extracting means extracts the distortion information on the basis of a three-dimensional virtual screen and generates the inverse-distortion information.

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7. The apparatus of claim 6, wherein the three-dimensional virtual screen is a virtual three-dimensional plane consisting of cross points between straight lines indicating a path of the reference image from a CRT (cathode ray tube) to the screen and virtual straight lines vertically formed on the screen from a point in which the reference image is displayed on the screen without distortion.

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8. A projection image display device, comprising:

a digital video signal processing means for converting an input video signal into a digital video signal;

an inverse-distortion information generating means for extracting a distortion parameter on the basis of the digital video signal and generating inverse-distortion information on the basis of the extracted distortion parameter;

a memory means for updating the extracted inverse-distortion information and storing it;

an inverse-distortion processing means for performing inverse-distortion processing of the digital video image on the basis of the stored inverse-distortion

information; and

an image projecting means for displaying the inverse distortion-processed image.

5           9.       The device of claim 8, wherein the inverse-distortion information generating means includes:

          a reference image generating means for generating a coordinate of the digital video signal;

          a displacement measuring means for displaying the reference image on a  
10       screen and measuring a coordinate of the displayed image; and

          a distortion information extracting means for extracting distortion information on the basis of a coordinate value of the set reference image and a coordinate value of the measured image and generating inverse-distortion information.

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          10.       The device of claim 8, wherein the memory means uses a SRAM so as to be performable high speed storing and access of the inverse-distortion information.

20           11.       The device of claim 8, wherein the distortion information extracting means extracts the distortion information on the basis of a three-dimensional virtual screen and generates the inverse-distortion information.

          12.       The device of claim 11, wherein the three-dimensional virtual  
25       screen is a virtual three-dimensional plane consisting of cross points between

straight lines indicating a path of a digital video signal from a CRT to the screen and virtual straight lines vertically formed on the screen from a point in which the digital video signal is displayed on the screen without distortion.

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- measuring a keystone distortion-parameter by displaying an input image  
              on a screen;
- performing inverse keystone distortion-correction of the input image on the  
              basis of the measured keystone distortion-parameter;
- 10           measuring a pincushion distortion-parameter by displaying the inverse  
              keystone distortion-corrected image on the screen; and
- performing inverse pincushion distortion-correction of the image displayed  
              on the screen repeatedly on the basis of the measured pincushion distortion-  
              parameter.

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              14.     The method of claim 13, wherein the keystone distortion-  
parameter and the pincushion distortion-parameter are measured by grasping  
displacement of certain points on the basis of the image displayed on the screen.

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              15.     The method of claim 13, wherein the keystone distortion-  
parameter and the pincushion distortion-parameter are gradually updated by  
performing each image distortion correcting process repeatedly.

16.     An image distortion correcting method using a three-dimensional  
25     virtual screen technique, comprising:

initializing a virtual screen showing keystone distortion and pincushion distortion;

generating an inverse-distorted image on the basis of the initialized virtual screen;

5       generating a distortion-corrected image on the basis of the generated inverse-distorted image and displaying the generated image on a screen;

      comparing the distortion-corrected image with the image displayed on the screen;

      updating the virtual screen when the image displayed on the screen is not  
10   coincided with the distortion-corrected image; and

      finishing the virtual screen updating when the image displayed on the screen is coincided with the distortion-corrected image.

17.     The method of claim 16, wherein the virtual screen is updated in  
15   the virtual screen updating step, and steps are repeatedly performed starting from the virtual screen initializing step.

18.     The method of claim 16, wherein a height of the virtual screen is varied according to variation of a virtual screen functional value of the keystone  
20   distortion and a virtual screen functional value of the keystone distortion in the virtual screen updating step.

19.     The method of claim 16, wherein the three-dimensional virtual screen is a virtual three-dimensional plane consisting of cross points between  
25   straight lines indicating a path of an input video signal from a CRT to the screen

and virtual straight lines vertically formed on the screen from a point in which the input video signal is displayed on the screen without distortion.

20. The method of claim 16, wherein the three-dimensional virtual  
5 screen is formed by adding a virtual screen functional value of the keystone distortion and a virtual screen functional value of the keystone distortion linearly.

21. The method of claim 16, wherein an image is divided into several blocks, and distortion of each image block is corrected.

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